

**1971**

**OPERATING  
SUMMARY**

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**ELGIN AREA**

**WATER SUPPLY SYSTEM**

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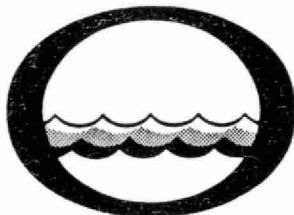
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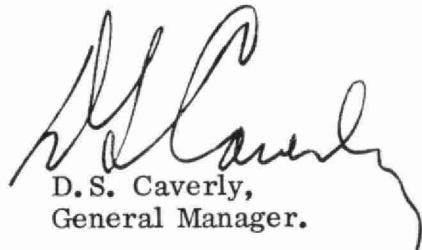


*Water management in Ontario*

Ontario  
Water Resources  
Commission

We are pleased to submit for your consideration a summary of operating during 1971 of the water supply system serving your community.

This operating summary contains parameters normally used to measure plant performance and to forecast demands for increased service, as well as relevant cost data. It is our objective to provide an adequate supply of safe and attractive water.



D.S. Caverly,  
General Manager.



D.A. McTavish, P. Eng.,  
Director,  
Division of Plant Operations.

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135 St. Clair Avenue West  
Toronto 195

## ELGIN AREA

### WATER SUPPLY SYSTEM

5-0002-65-1	Primary System
5-0002-65-2	Secondary System #1
5-0003-65	Tertiary System #1
5-0087-68	Secondary System #2
5-0013-68	Tertiary System #2

## 1971 ANNUAL OPERATING SUMMARY

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This is the fourth annual report on the Elgin Area Water System and it covers the start-up of the new Elgin Area Water Treatment Plant near Port Stanley and the shutting down of the Commission-owned old St. Thomas Water Treatment Plant.

The annual consumption of the Ford of Canada Plant at Talbotville increased by 6 MIG to 321 MIG. The City of St. Thomas received 965 MIG - a decrease of 15 MIG. For the first six months, Ford was supplied with chlorinated lake water and St. Thomas was served by the old St. Thomas Treatment Plant on Kettle Creek and the McKenzie Well.

In July, the new Treatment Plant at Lake Erie was in partial operation. Fully treated water was available for Ford and for supplementing the old St. Thomas Plant output. As testing and adjusting work at the new plant was completed and the degree of dependability of the equipment increased, greater flows of lake water were directed to the City. On September 30, the transfer was completed and the old St. Thomas Plant was retired. The McKenzie Well was shut down on December 31.

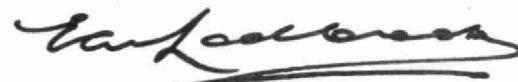
Staff co-operated closely with the St. Thomas PUC in the installation of piping, metering and controls for the City's connections. Division of Construction and the Consulting Engineers gave on-the-job training to the plant staff, making plant start-up and continuous operation very successful.

Plant staff installed pumps to increase the Booster Pumping Station capacity from 3.5 MIGD to 10 MIGD and erected a 1,000 KVA 27.6 KV electric transformer sub-station.

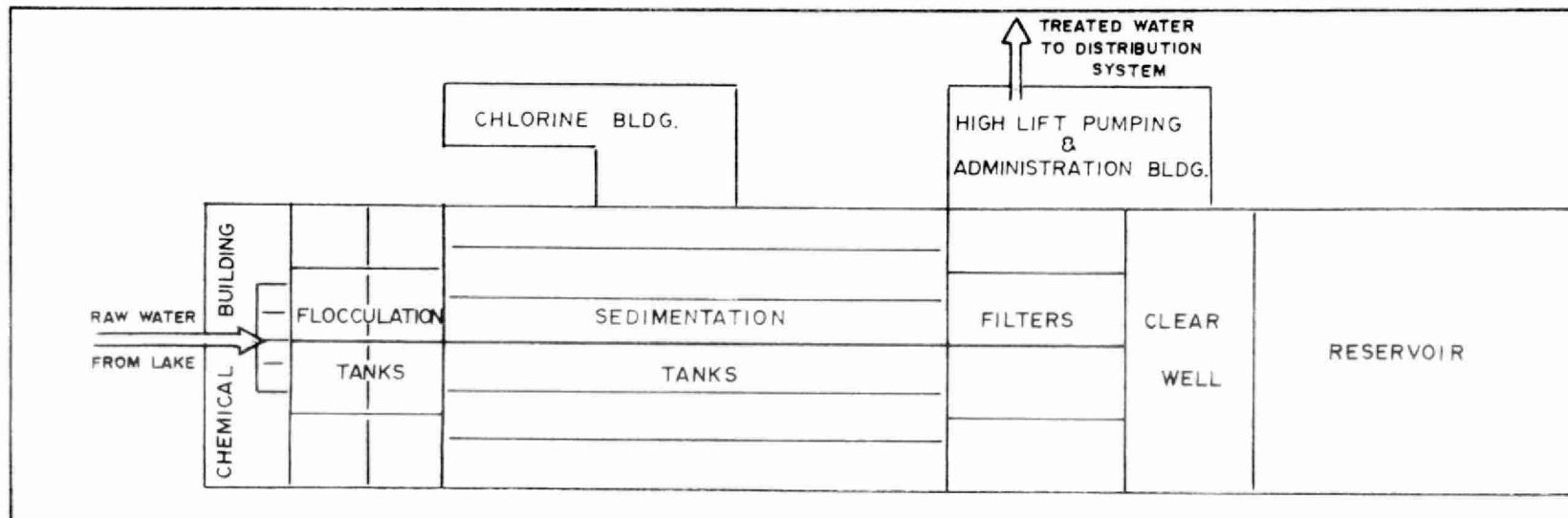
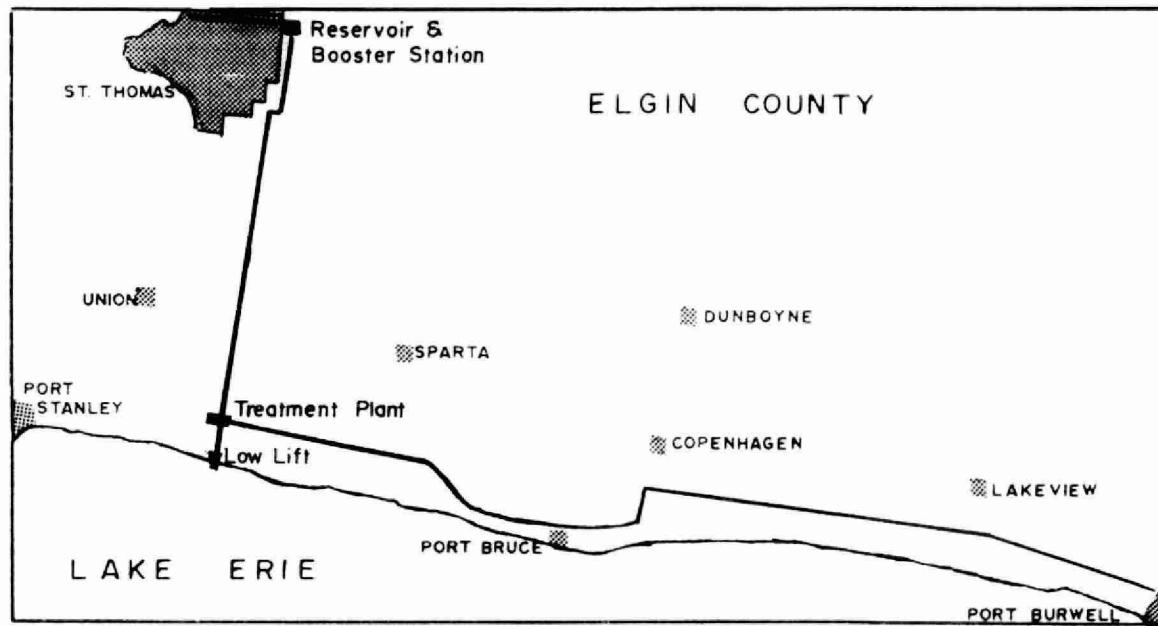
The average turbidity of the chlorinated lake water delivered to Ford was 10 JTU. The highest recorded turbidity was 36 JTU. The turbidity of the new plant effluent was less than 1 JTU consistently.

All useable electrical, pumping and chemical feed equipment at the old St. Thomas Plant was removed to storage. The future use of the old water plant was discussed with St. Thomas City Council and at the year end, the Council had shown no interest in taking over the building in its present condition.

In the late Fall, the secondary pipeline to Port Burwell and the Port Burwell Village Distribution System were taken over for operation



E. A. N. Ladbrooke, P. Eng.,  
Engineer-Manager  
Lake Huron and Elgin Area  
Water Supply Systems.



# DESIGN DATA

NOMINAL CAPACITY - 10 MIGD

## INTAKE

Size: 4000 ft. of 60" dia.

Material: Reinforced concrete

Depth of intake: 30 ft.

Capacity: 40 MIGD

## LOW LIFT PUMPING STATION

4 vertical turbine pumps;  
total firm capacity 10 MIGD @ 150  
ft. TDH

## TREATMENT PLANT

a) Chemical Mixing Chambers

Size: 30,000 gal

Detention time: 4.4 min @ 10 mgd

b) Flocculating Tanks

Type: Walking beam

Size: Two 52'x40'x12' (310,000 gal)

Detention time: 46 min @ 10 mgd

## PIPELINE

### Project:

Primary: Treatment Plant  
to Reservoir

RAW WATER SOURCE - Lake Erie

c) Sedimentation Tanks

Size: Two 204'x52'x12' (avg.)  
(1.6 M.G.)

Detention time: 3.8 hr @ 10 mgd

d) Filters

Type: Anthracite & sand

Size: Two 52' x 20'

Capacity: 10 mgd @ 4 USGPM/sq. ft.

e) Clear Well - 143,000 gal.

f) Reservoir - 625,000 gal (fixed)

g) Reservoir - 920,000 gal (variable)

h) High Lift Pumps

4 vertical turbine pumps, firm  
capacity 10 MIGD @ 225' TDH

## SYSTEM RESERVOIR

Size: 215'x235'x22' (6 million gallons)

## BOOSTER PUMPING STATION

Pumps: 3 horizontal centrifugal  
@ 5 MIGD each

Standby: Diesel/Electric generator  
standby power for one pump.

## ELEVATED TANKS

Ford Branch:

Capacity: 167,000 gal

Pipeline: TWL - 950 ft.

Port Burwell:

Capacity: 334,000 gals.

Branch Pipeline: TWL - 780 ft.

NOTE: St. Thomas City tank is  
500,000 gals. capacity at TWL  
890 ft.

		<u>Size</u>	<u>Max. Flow</u>
Primary:	Treatment Plant to Reservoir	30"	20.0 MIGD
Secondary #1:	Booster P.S. to Talbotville Area	30"	20.0 MIGD
Secondary #2:	Treatment Plant to Port Burwell	12"	0.53 MIGD - Design Fire Flow 640 IGPM x 3 hours

The Elgin Area Water System is located in Elgin County in the southwestern part of the province. The water system serves the City of St. Thomas, the Ford of Canada Plant at Talbotville, the Village of Port Burwell, and the system was designed to supply all the adjacent townships and villages. For accounting purposes, the system is sub-divided as follows.

Primary System

This comprises a low lift pumping station, a treatment plant and a large reservoir. The old St. Thomas Water Treatment Plant and Pumping Station and two wells, which were taken over from the City in September 1969, were taken out of service during 1971.

Secondary System #1

This comprises a booster pumping station and five miles of 30" main with two branch connections to the City of St. Thomas and an elevated tank.

Secondary System #2

This comprises a 12" diameter pipeline, 22 miles long, running east from the treatment plant to the Village of Port Burwell.

Tertiary System #1

This comprises a 1.4 miles long 20" diameter pipeline and metering station for the Ford of Canada Plant.

Tertiary System #2

This is the provincially-owned distribution system in the Village of Port Burwell.

### PRIMARY PROJECT

At the low lift pumping station, the third stage impeller was removed from each of the four low lift pumps to match the reduced head in pumping to the new treatment plant. The pumps were overhauled and the suction pipes were sand-blasted and painted with epoxy. The temporary raw water chlorinator was removed and re-installed at the new plant.

Plant staff assisted in the start-up of the new treatment plant, in disinfecting and establishing the filtering routines. In July, regular daytime filtration was carried on under the direction of the consulting engineers and contractors for supplying treated water to the Ford Plant and to supplement the St. Thomas City supply. By September most of the pump testing and other interruptions to regular operations were ended. The new plant went into three-shift operation and the old St. Thomas Plant was reduced to part-day shift operation. After two weeks uninterrupted routine at the new plant, the old St. Thomas Plant was taken out of service on September 30. At the new plant there were several minor problems, such as too rapid flocculation, incomplete metering, noisy pump motor bearings and erratic chemical dosing equipment. Fortunately, the control system was in successful operation for the take-over of the plant, and the staff's confidence in the equipment is growing.

### SECONDARY SYSTEM #1

New control equipment was installed at the booster pumping station and at the main control room at the treatment plant to indicate the levels of the Ford and St. Thomas elevated tanks and the flows into the City of St. Thomas. The equipment was specified by the Project Operations Special Services Group and installed by the plant staff. At the booster pumping station, the increased flow to St. Thomas required the replacement of the 1.75 MIGD pumps by 5.0 MIGD pumps with 200 horsepower motors. The increase in power demands made a change in supply voltage from 4160 volts to 27,600 volts necessary. Ontario Hydro supplied a 1,000 KVA electric

transformer and the sub-station lattice tower, switches and cable together with the pump and motor, and motor starter installation work was carried out by the plant staff.

Also, plant staff installed a 30" x 24" tee and 30" valve in the booster pumping station discharge main for a second connection for the City and assisted the St. Thomas PUC crew in installing pressure controls and metering equipment in the two meter chambers on the two pipeline branches feeding the City. The Ford branch pipeline elevated tank was painted inside and outside.

#### SECONDARY SYSTEM #2 and TERTIARY SYSTEM #3

In November, responsibility for the operation of the Port Burwell branch pipeline and village distribution mains, hydrants, and service pipes passed to the system staff. Disinfection was completed by the Contractor and connections to houses started. There were many complaints of taste and much time was spent in flushing. The elevated tank signal equipment was not ready, so the tank was filled at weekly intervals. Eventually, it was found that the cause of taste was hypochlorite powder mixed in a layer of sand in the elevated tank. The sand and hypochlorite had not been flushed away after construction and disinfection.

#### STAFF and TRAINING

Plant Operator, F. Bartlett passed the Senior Plant Operators Course (OWRC) with a 'B' grading. R. Power was hired as a casual maintenance technician and was appointed to the permanent staff. Students were hired during the summer for outside maintenance and the clean-up of the new treatment plant.

#### CITY OF ST. THOMAS

The Engineer-Manager and the Plant Staff worked closely with the St. Thomas PUC General Manager and Waterworks Superintendent in the timing of the installation of the connections into the City of St. Thomas Water System. The PUC assisted the OWRC by providing a crane for lifting the sub-station tower and a backhoe for making the pipeline changes. The Mayor, Council members, and the Department heads of the City inspected the old treatment plant to evaluate its possible use for community purposes, and invitations for suggestions on its future use were invited from the public by the Council.

The Engineer-Manager attended at meetings of the Council's of the Village of Port Burwell, Townships of Malahide and Yarmouth to discuss operating arrangements and possible future agreements for the supply of water.

STATEMENT OF REVENUES

<u>MONTH</u>	<u>FORD</u>	<u>ST. THOMAS</u>
January	\$ 9,338.30	\$ 24,689.91
February	13,813.14	22,454.36
March	15,433.86	25,092.55
April	13,115.61	24,981.22
May	12,431.09	28,597.94
June	16,948.13	30,624.44
July	11,970.19	34,091.68
August	15,017.32	34,364.79
September	16,134.15	29,337.16
October	12,801.36	28,609.34
November	13,419.51	27,001.16
December	11,796.03	27,958.60
	—————	—————
	\$162,218.69	\$337,803.15
	GRAND TOTAL	<u>\$500,021.84</u>

ONTARIO WATER RESOURCES COMMISSION

ELGIN AREA WATER SUPPLY SYSTEM

PROJECT NO. 5-0002-65

BALANCE SHEET

AS AT DECEMBER 31, 1971

(UNAUDITED)

ASSETS

CASH	\$ 6,471.06
ACCOUNTS RECEIVABLE	27,958.60
FIXED ASSETS (at cost)	12,468,724.48
	<hr/>
TOTAL ASSETS	\$12,503,154.14
	<hr/>

LIABILITIES AND EQUITY

CURRENT LIABILITIES	\$ 622,992.32
LONG TERM DEBT	9,435,655.86
EQUITY	
Contributed	3,065,978.00
Amortized principal on long term debt	88,109.37
Earned Surplus/Deficit	
Deficit at beginning of year	(\$287,046.13)
Deficit for the year 1971	(\$422,535.28)
	( 709,581.41)
	<hr/>
TOTAL LIABILITIES AND EQUITY	\$12,503,154.14
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Note

Prepared on an accrued basis.

## CUSTOMER CONSUMPTION

MONTH	FORD OF CANADA LIMITED			CITY OF ST. THOMAS		
	CONSUMPTION IN MILLION IMPERIAL GALLONS			CONSUMPTION IN MILLION IMPERIAL GALLONS		
	1969	1970	1971	1969	1970	1971
JAN	13.08	20.81	18.49		86.61	70.54
FEB	9.31	20.56	27.35		77.89	64.16
MAR	10.72	22.17	30.56		87.34	71.69
APR	16.39	22.89	25.97		79.82	71.37
MAY	23.94	27.16	24.62		82.71	81.71
JUNE	28.84	31.67	33.56		84.76	87.50
JULY	33.71	21.77	23.49		83.07	97.41
AUG	22.07	23.58	29.74		94.58	98.19
SEPT	37.61	32.71	31.85	95.00	80.59	83.82
OCT	35.35	32.96	25.35	92.20	78.59	81.74
NOV	28.17	32.47	26.67	96.20	74.17	77.15
DEC	23.42	26.52	23.36	85.50	69.89	79.88
TOTAL	282.61	315.26	321.01	358.90	980.02	965.16

## PLANT FLOWS

MONTH	LOW LIFT PLT (AT LAKE)	NEW PLANT			OLD ST. THOMAS TREATMENT PLANT				MCKENZIE WELL	
		CHLORINATED LAKE WATER	RAW FROM LAKE	FILTER WASH	PLANT OUTPUT	RAW WATER		FILTER WASH	PLANT OUTPUT	
						LAKE	CREEK			
JAN	18.9						57.1	1.9	55.2	15.3
FEB	29.6						51.9	1.7	50.2	14.0
MAR	30.4						58.0	1.9	56.1	15.6
APR	25.8						58.2	1.8	56.4	15.0
MAY	26.1						68.2	2.1	66.1	15.5
JUNE	34.9						77.0	2.8	74.2	13.3
JULY		38.9	1.1	37.8			70.8	3.0	67.8	15.3
AUG		66.4	2.4	64.0			47.3	2.9	50.2	13.7
SEPT		74.3	2.4	71.9			30.6	1.8	28.8	15.0
OCT		93.3	1.7	91.6						15.5
NOV		93.7	3.6	90.1						14.3
DEC		94.9	4.9	90.0						14.0
TOTAL	-	-	-	611.1	-	-	-	-	505.0	176.5

## BACTERIOLOGICAL SAMPLES

MONTH	LAKE ERIE PLANT				MCKENZIE WELL		ST. THOMAS TREATMENT PLANT			
	RAW WATER		TREATED WATER		CHLORINATED		RAW WATER		TREATED WATER	
	NUMBER OF SAMPLES	AVG. DENSITY Coliforms/100ml	NUMBER OF SAMPLES	NUMBER WITH COLIFORMS	NUMBER OF SAMPLES	NUMBER WITH COLIFORMS	NUMBER OF SAMPLES	AVG. DENSITY Coliforms/100ml	NUMBER OF SAMPLES	NUMBER WITH COLIFORMS
JAN	3	5	7	0	8	0	4	185	16	0
FEB	3	19	8	0	7	0	3	2400	16	0
MAR	5	180	8	0	9	0	6	1430	18	0
APR	4	30	9	0	9	0	4	750	18	0
MAY	5	26	9	0	9	0	5	30	18	0
JUNE	5	8	14	0	9	0	5	460	18	0
JULY	4	33	9	0	9	0	4	1270	18	0
AUG	5	120	9	0	9	0	5	4550	18	0
SEPT	5	26	10	0	10	0	5	1300	20	0
OCT	5	8	17	0	6	0	-	-	-	-
NOV	9	0	35	0	9	0	-	-	-	-
DEC	10	1	29	0	9	0	-	-	-	-

## WATER QUALITY

PROPERTY	LAKE ERIE PLANT		MCKENZIE WELL	OLD ST. THOMAS TREATMENT PLT.	DESIRABLE STANDARDS
	CHLORINATED LAKE WATER	FULL TREATMENT	CHLORINATED	KETTLE CREEK	
HARDNESS in mg/l as CaCO <sub>3</sub>	140	144	88	270	80 - 100
ALKALINITY in mg/l as CaCO <sub>3</sub>	90	96	150	170	30 - 100
IRON in mg/l Fe	0.15	.16	.10	.05	Less than 0.3
CHLORIDE in mg/l Cl <sup>-</sup>	26	26	73	20	Less than 250
pH in pH units	8.0	7.6	8.1	7.9	7.0 - 8.5
FLUORIDE in mg/l F <sup>-</sup>	.1	.1	1.5	1.0	Less than 1.2
AMMONIA in mg/l as N	0.3	0.2	0.60	.35	Less than 0.5
TOTAL KJELDAHL NITROGEN in mg/l as N	.25	.16	0.66	.76	Less than 1.
NITRITE in mg/l as N	.002	.0001	0.003	.02	
NITRATE in mg/l as N	.20	.020	0.010	1.1	Less than 10
TOTAL PHOSPHORUS in mg/l as P	0.022	0.10	0.042	.014	
SOLUBLE PHOSPHORUS in mg/l as P	0.015	.005	0.036	.004	
COLOUR in Hazen Units	5	1	L 5	L 5	Less than 5
TURBIDITY in FTU	8	1	L 1	L 1	Less than 1

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